

A	RRRR	PPPP	A	N	N	EEEE	TTTT
A A	R R	P P	A A	NN	N	E	T
A A	R R	PPPP	A A	N	N N	EEE	T
A A A A	R R	P	A A A A	N	NN	E	T
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N N	EEEE	W	W			SSSS	
NN N	E	W	W			S	
N N N	EEE	W	W			SSSS	
N NN	E	W	W			S	
N N	EEEE	WW	WW			SSSS	

Issue 1

March 1973

ARPA Network Information Center
Stanford Research Institute
Menlo Park, Calif. 94033

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INTRODUCTION

The ARPANET NEWS will be published online and in hardcopy by the NIC. This newsletter is your medium for informing the ARPANET community about events, plans, new capabilities, requirements, and other newsworthy items relative to your site.

Submissions for the NEWS should be directed to Jean Iseli (JI), preferably through the Journal. Other persons desiring editorial involvement with the newsletter should direct their desires to JI.

Prior to distribution, the NEWS will have been edited by Jeanne North of the NIC to ensure a coordinated effort with other mediums of information exchange initiated at the NIC. The ARPANET NEWS takes its place in Network information services among the Journal, the RFC's, the Functional Documents, the NIC Announcement Bulletin, and the forthcoming NIC Journal Index. Its editors anticipate interesting expansion and development as Network contributors take advantage of its potential.

Distribution will be made in an unusual way. An announcement will be sent you through the Journal when the basic issue of the month is published. The content of the issue will be printed in hardcopy for distribution. Newsgathering will be continuous, and each Monday a weekly update will be posted in online copies. The next month's issue will contain the interim news updates and added feature articles.

In the following section giving information about the publication, there are instructions for accessing the NEWS online from a TTY or display. Hardcopy will be sent to all sites through the mail.

Although the content and format of the NEWS may vary, issue to issue, the following sections will be regarded as standard for each issue.

CALENDAR	RESOURCE NEWS
ARTICLES	PLANS
FEATURED SITE	OTHER NEWS
PROTOCOLS	

2

2a

2b

2c

2d

2e

2f

2g

ARPANET NEWS Information About the Publication

Issue 1 March 1973

3

Online version prepared weekly

Hardcopy version distributed monthly

3a

Distributed by: ARPA Network Information Center

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3b

Editors: Jeanne B. North (NIC)

Jean Iseli (MITRE)

Contributing Editors: Susan S. Poh (MITRE)

Ernie H. Forman (MITRE)

3c

The online version is sent to all Network members who receive online delivery from NIC. It can also be accessed by anyone who logs into SRI-ARC and uses the query language named NIC.

3d

The online version contains the month's basic issue. Each week a branch is added, containing items received during the week. At the first of the next month, the added branches are merged, any new items of the preceding week and some feature articles are included, and the basic issue for the month is produced to supercede the previous month's basic issue.

3e

For scanning on TTY:

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a/rpanet news) CR

s/(how) (whatever you choose from the contents) CR

(to stop printing) control o (to exit) q/uit) CR

(to show statement numbers) v/:type View specs:) mG CR

For printing entire NEWS:

nls CR

l/oad) f/file) <nics>arpanews CR CR

o/utput d/evice t/etotype) CR

For printing Updates only:

l/oad) f/file) <nics>arpanews CR CR

SP .2 CR

o/utput) d/evice) t/etotype) CR

From a display, enter NLS, load file <nics>arpanews, and look at various levels by changing viewspecs.

One hardcopy of the monthly issue will be sent to each Liaison, Principal Investigator, and Station Agent at Network Sites, and to Network Associates. Local reproduction is encouraged.

3f

CALENDAR Events of Network Interest

A meeting listed here is sponsored by the Group named. Many meetings are open to other interested people. NIC document references are given where available.

Meetings sponsored by Groups in the Network are indicated by *.

DATE	SPONSOR	MEETING	PLACE	NIC
	NIC	No TNLS Course in March		4c
3/16	FTPIG	*File Transfer Protocol Meeting Anyone wishing to attend should contact Alex McKenzie (Ident AAM) at BBN.	BBN	4d
3/22-23	ACM	Psychology of Computer Programming Seminar by Gerald Weinberg for senior personnel Fee: \$190, \$235. Contact ACM, 1133 Ave. of the Americas, N.Y. 10036 (212) 265-6300.	Chicago	4e
3/27-29	Conf on Industr Robot Techny	(Datamation, Feb)	Nottingham, Eng.	4f
3/28-30	IEEE	INTERCON/73 Theme: Solid State Shapes the Future. Contact: Don Larson, IEEE, 345 E. 47th, N.Y. 10017. (Datamation, Jan)	N.Y.	4g
4/1-4	IIA	5th National Meeting Theme: Information: The Industry of the 70s? IIA, 904 Montgomery Bldg., Wash.D.C. 20014 (301) 654-4150.	Phila.	4h
4/4	IEEE	Minicomputers--Trends, Applications Contact: Minicomputer Symp., P.O. 639, Silver Spring, Md 20901.	Gaith, Md.	4i
4/16-17	ACM	Psychology of Computer Programming Seminar by Gerald Weinberg for senior personnel Fee: \$190, \$235. Contact ACM, 1133 Ave. of the Americas, N.Y. 10036 (212) 265-6300.	L.A.	4j
4/16-19	ACM	Psychology of Computer Programming Seminar by Gerald Weinberg for senior personnel Fee: \$190, \$235. Contact ACM, 1133 Ave. of the Americas, N.Y. 10036 (212) 265-6300.	S.F.	4k

5/16-18 ONR Symp. on Complexity of Seq. and CMU
Numerical Algorithms. Contact: Computer
Science Dept., CMU

6/4-8 AFIPS 1st Nat'l Computer Conf. & Expo. N.Y.
Chmn, Methods and Applications Program,
Dr. Robert W. Bemer, c/o Honeywell Information Systems,
P.O. Box 6000, Phoenix, Ariz., 85005 (602)993-2569.

8/20-24 3rd Int'l. Jt. Conf. on AI Stanford
Contact: Prof. J. McCarthy, SU-AI
(Artificial Intelligence, 3, 1972, p.289-290)

10/15-17 IEEE, Switching & Automata Theory Symp. Iowa City 13957
U.Iowa 14th Annual. Abstracts to: M.R. Strong,
IBM TJW Res.Center, P.O. 216 Yorktown Heights, 10598.
Reg.: Prof. Gerard Weeg, Chmn. Comp. Sci. Dept., U.of Iowa,
Iowa City, 52240

4m

4n

4o

4p

ARTICLES Reports from COMPCON 73

Notes on the Conference

5
52
COMPCON 73 opened its 3-day program Tuesday February 28. This is the "first annual" COMPCON in S.F. (There was a COMPCON 72 last September, and this is also the 7th annual IEEE Computer Society International Conference.) The theme was "Computing Networks from Minis through Maxis--Are They for Real?"

By Wednesday, over 700 attendees had registered. Attendance at sessions was large and steady. Ties and jackets were the norm, and dialogue was even-toned. No tensions were evident, the atmosphere was purposeful, prosperous, confident. There were no exhibits. Small-group conversation was facilitated by cocktail hours, 5-7, in the meeting-room area, on Tuesday and Wednesday.

Dr. Ruth Davis' keynote address is digested on the next page, and excerpts from Larry Roberts' leadoff paper follow. Many other Network members were speakers, and the Digest of Papers of the Conference, available from IEEE for \$15 or \$20 (nonmembers), is a recommended acquisition.

-----Jeanne North

Excerpts from Ruth Davis' Keynote Address

5b
Computing Networks: a Powerful National Force
Keynote Speech COMPCON 73 February 27 1973
5b1
Dr. Davis' paper is online (14758). (Online users will recognize
this parenthetical expression as a link to the online file). This
is a 5-page excerpt, and those readers who have access may prefer
to print out the original file.
5b2

5c
"I believe we should highlight the truth today; namely
1

"1. Computer networks are essential for all those
geographically dispersed control activities vital
individual and national well being...
5c1a

"2. Computer networks are the only practical means
for the sharing of expensive information resources
computing
resources, and information handling equipment...
5c1b

"3. Computer networks are the only practical means of providing
equality of access to and an equality of quality in public
services, independent of geographical location...
5c1c

"4. Minicomputers are becoming personal computing resources and
minicomputers linked to computer networks provide each of us
our own individual information center.
5c1d

"..Researchers should be truly excited over the prospects of
simultaneously having a minicomputer as a personal computer
resource and, through it, being able to share results with
peers everywhere. With computer networks, the loneliness of
research is supplanted by the richness of shared research.
5c1e

"5. Minicomputers available through computer networks are
perhaps the only economically justifiable means for the large
scientific calculations essential to the advancement of much
needed basic research and engineering.
5c1f

"..Computer networks perform two essential tasks in
developing increased computer power. They aggregate the
market for computing power and they supply the sole means
for cost-sharing expensive development among customers.
5c1g

"6. Manufacturing without minicomputers in the production
process will be unheard of...
5c1h

"7. Centralized management, in a real-time sense, of geographically dispersed organizations is impossible without computer networks..."

5c1g

"I should like to advance a four-part plan that I consider as minimal in meeting our obligation--as network users and technologists--to society and to the beneficial application of computer technology.

5c2

"1. We must stop the trend towards negative actions being taken at the national level in dealing with computer networks.

5c2a

"..What we are experiencing is a reaction against all types of computer networks based on condemnation of practices in the "data bank" networks.

"..We must work together as customers for and providers of computer network services, to obtain executive, legislative and judicial actions that encourage or demand, as appropriate, the disciplined, controlled access to computer network services..."

"..I should like to stress the need we have today for the IEEE Computer Society, the ACM and AFIPS as professional societies to present coordinated plans for imaginative and innovative development of computer networks as a service to any or all segments of government, industry and academia.

"2. We must stop treating computer networks as tinker toys of technology and recognize that they have become technological partners to management, to services, and to government.

5c2b

"..By the mid-1950's more than half the population of the United States was not making things to eat or use, but was gainfully employed doing something for other people. Thus, the United States became a service economy and the first post-industrial nation. Today, more than 63% of the United States labor force is employed in the service industry. By 1980, statisticians believe that two out of three members of the labor force will be part of the service sector.

"..The technologies that are integral with a service economy or a post-industrial society and those which are essential to achieve its goals include communications technology, computer technology and information technology. These are best linked to users, services, and products by means of computer networking.

"3. We must realistically plan a future for computer networks without a government public or national policy. There is no federal or national policy today concerning computer network utilization. I foresee none in the near future. Neither do I see any convergence of opinions as to either the need for or the content of any federal or national policy. In fact, if anything, there is an increasing fractionalization of opinion on the subject.

5c2c

"4. We must isolate the major impediments to computer utilization today and focus our attention as well as the attention of national leaders on them...The problems which constitute serious threats to good network usage include:

5c2d

"a. An inability to control accessibility to computer networks so as to provide adequate guarantees of privacy and security.

"b. A lack of fair and uniform pricing policies.

"c. A total inadequacy of documentation which would allow efficient network use...

"d. An inadequacy of standards governing network usage ranging from the use of programming languages to the hand-shaking or network protocols.

"e. The lack of conventions for protecting the rights of customer and seller alike.

"f. An inability to perform real-time control functions via computer networks.

"g. The lack of specification of levels of network service and the lack of means of assurance that specified service levels have been met.

"For example networks have generated a new phenomenon which I shall call:

"Solutions Without Redress"

"This problem manifests itself when a customer uses a program supplied on the computer network to obtain answers which are used by the network customer in selling his product or service--and the answers are wrong.

"As computer professionals, we owe the world a continuing technological assessment of computer networks. Indeed, there are a number of questions to which all of us interested in the assessment of computer networks would like to have answers. Some of these are:

"How have computer networks changed the customers for computer services?..

5c3

"How have computer networks increased the types of applications of computers for industry, academia and government?..

5c4

"How have computer networks been utilized to increase productivity in a measurable way in manufacturing, in services or in government?..

5c5

"How have computer networks reduced the costs of sharing information and computer power so that costs of management and decision making are reduced relative to quality of output?

5c6

"How have computer networks affected computer system design, architecture, technology and popularity?..

5c7

"How have computer networks aided the performance of public services and thus gained the favor of large segments of the American public?..

5c8

*****excerpts by Jeanne North

5c9

5c10

Excerpts from Larry Roberts' Paper

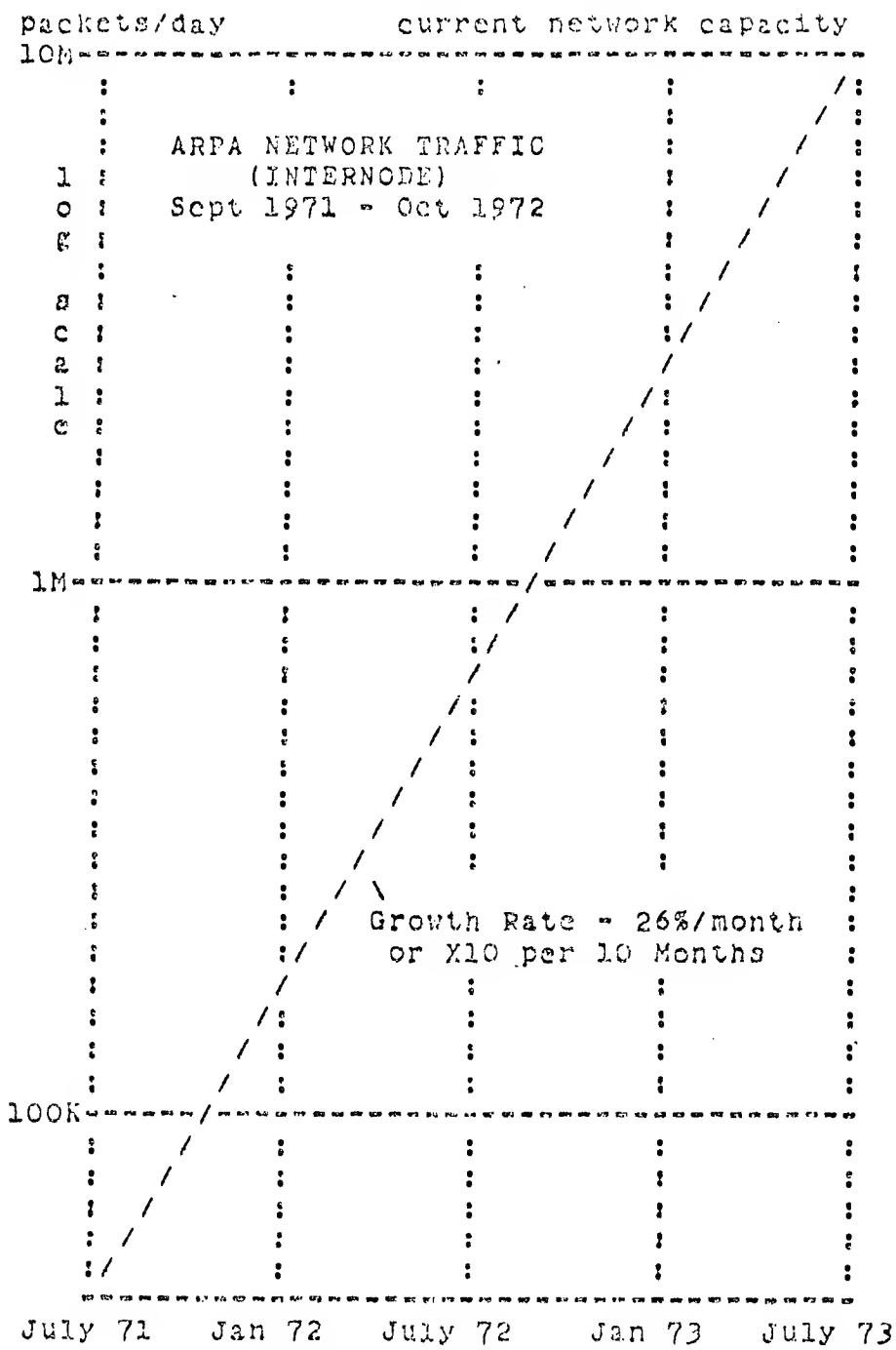
Network Rationale: a 5-Year Reevaluation

5d

"A six-month Air Force test of the network for the pure movement of data traffic showed that throughput rates of 20-30 KB could be maintained. (Forthcoming changes to the routing technique should more than double this.) The test results also showed a lower monthly cost, while providing at least ten times the throughput and responsiveness of the alternatives available. So it has turned out that this type of network usage (pure data movement) is both economic and attractive even though the original design goals of the network were aimed at interactive computing. For the network, such data traffic is useful since it provides a large low-priority background load which expands the instantaneous capacity available and helps maintain efficient line utilization, thus reducing the cost to everyone.

"...Usage has increased exponentially at .26% per month..while network size has only increased linearly by one node per month. Internode traffic in October 1972 (see graph) was 1.3 million packets per day which corresponds to 9% of the compute power in the network being used remotely...the network also handled .45 million packets per day of local traffic, which means that 12% of the total computing power of the network's 22 serving host computers was distributed via the network. On an annual basis the value of this computer time would be \$2.1 M or slightly more than the network cost. However, at the current growth rate the network should be fully loaded by July 1973...Since the cost saving incurred by selecting the proper network computer for each problem is usually 100 to 300%, the network is already cost-effective. When it is fully loaded, the network costs only amount to 10-15% of the computer costs."

Online version of Figure 1



excerpts and graph...Jeanne North

Other Sessions

5e

Two sessions at COMPCON 73 titles "Examples in the Business Community" and "The Singer Retail Network" were added to the program as examples of networks that are being implemented in business and industry today. These examples provided balance to a program otherwise largely describing networks and design problems in academia and government-supported examples.

The Singer retail net is one for the purpose of handling the information in department stores directly related to point-of-sale, cash management, and inventory. The Jewel Companies, Inc. network is an in-store minicomputer driving point-of-sale terminals in a supermarket environment. Such Electronic Store Information Systems (ESIS) provide management information to the local store manager. These in-store minicomputers are connected via common carrier to a large computer utility at corporate headquarters which permits not only the necessary information transfer by the local and corporate levels but general computation power and file inquiry at the store level. The Honeywell Information System paper described the specialized, intelligent terminal to be used in a banking network environment.

-----Steve Miller

FEATURED SITE Range Measurements Lab

The Range Measurements Laboratory, Patrick Air Force Base, Florida, has recently been connected as a major terminal in the ARPANET. Col. Edward P. Schelonka acts as Liaison, and Michael S. Young is serving as Station Agent.

The Laboratory has been in existence since 1965 and has been and is involved primarily with ARPA projects requiring a quick reaction response to technological concepts.

Assigned projects have required the exercise of a variety of disciplines, with the assigned staff members performing all the steps of hardware and system implementation beginning with the original concept, through design and fabrication to field testing and system turnover to the final customer. In doing these things, the Laboratory has developed the staff skills and physical facilities to perform significant work in the following fields:

- a. Advanced optics, including absolute optical measurements, interferometry and analyses of optical imaging and image tracking technology;
- b. Radar and tracking analysis, including re-entry and field measurements analysis;
- c. New systems concepts and analysis;
- d. Photo/chemical techniques and analysis;
- e. Electronic systems;
- f. Tethered lighter-than-air research and operation;
- g. Image restoration and analysis;
- h. Computer systems design including real time applications.

In the Fall of 1972, arrangements were made by Mr. Harold Newby, Imaging Systems Branch Chief, and Mr. Walter H. Manning, Jr., Laboratory Director, to have some of the ARPANET management functions transferred to the Laboratory. Since that time a gradual transition has occurred so that now the responsibility for development, expansion, operation, and maintenance is within the Data Systems Branch of which Lt. Col Edward Schelonka is Chief. The RCA Services Company provides technical assistance to the Laboratory in support of ARPANET functions as well as other programs.

ARPA Headquarters has given RML responsibility in several areas: 6c
Development, operation, maintenance, management and expansion of
the ARPA Network.

Assignment of communication lines for the Network.

Arrangement, through Defense Commercial Communications Office
(DECCO), to place requirements on ATT to provide lines.

Apprising government community of services available, to the
extent of contacting potential user, talking with him, sending him
to MITRE to look at Network features.

Study of functioning of present ARPA Network features, and
identification of what would be required to set up a commercial
network.

The RML TIP was brought up in January of 1973 and on 7 February 1973
intefaced with a terminal to allow use of Network Resources. 6f

-----Mike Young

PROTOCOLS

UTAH-10 : Receiving favorable response to RFC 403 (11925,) 7
UTAH is progressing, post haste, to implement an RJE Server to allow
network users to submit batch jobs both to their PDP-10 and
UNIVAC-1108. Availability is projected towards the end of March,
first of April time period this year. One deviation from 'Standard'
Protocol: if the foreign host will not accept block structured FTP
type transfers, the transfer will default to 8 bit ASCII type.
Documentation relative to access mechanisms will be forthcoming.
.....Greg Hicks

7a
7b

7b

RESOURCE NEWS New Programs and Publications

CCA-TENEX: The version of the DATACOMPUTER software that was used for the 'Weather demo' at the ICCC in Washington last October is running at CCA under the name 'RELEASE 0/8'; several Network sites are using it on an experimental basis. 'RELEASE 0/9', which incorporates better error diagnostics and some new features will be available this Spring. Owners of large data bases who would like to store them on the DATACOMPUTER and use its Data Management facilities should contact Don Cantor at: Computer Corporation of America, 575 Technology Square, Cambridge, Mass. 02139. -----Don Cantor

Harvard - 10 : A new remote job entry service is announced; documentation is in preparation; anxious to have Network users employ capability; preliminary indications of interest should be directed to Bradley Reussow (617) 495-3998.

.....Bradley Reussow

ILLIAC : Small interactive programs can now be run on the ILLIAC-IV.
.....Steve Crocker

LLL : Will accept an 11/10 in June on which they will run ILL's standard ANTS. By year's end, and perhaps even by September, they will receive their 11/45 on which they will run their own homegrown multiprocessing system? ..?.....Jed Donnelley

SRI-AI : Documentation for QA4, an experimental programming language for writing problem-solving programs, is published as Artificial Intelligence Center Technical Note 73 "QA4: A Procedural Calculus" by J.F. Rulifson, J.A. Derksen, and R.J. Waldinger. (NIC Catalog Item 13318).....Mike Wilber

UCLA-CCN : A new version of the structural analysis package, NASTRAN, is now available.Bob Bell

UCSB : A PDP-11 with a special host interface is now up and represents the first very distant host on the network.
.....Roland Bryan

LANS

ALOHA TIP : is up and has 3-5 terminals active; plan to connect BCC computer in the future. 9

.....Chris Harrison (UH)

LBL : Expects to have its CDC 7600 and CDC 6600 on the Network by July 1. 9a
.....Bob Fink

MIT : A second IMP will be installed to accomodate a fifth host. 9b
.....ARPA/IPT(Dolan)

Kjeller Institute : Expected to join Network by mid-May '73. 9c

Kjeller

P.O. Box 25

Kjeller, Norway

Telegrams: FFIEE Lillestrom

Telephone: Lillestrom 71 26 60

Plans, which are not finalized, are for a connection to "RBK-Computer Center" (CDC-Cyber-74) : will consider exchange agreements with other ARPANET Host installations. Will support: RJE and Interactive (CD"Intercom") and Control Data 6RM Record Manager. Norwegian Climatological data and onservation material available on special request from one of their users, the Norwegian Meteorological Institute. 9e
.....Yngvar Lundh

Rutgers University : Expected to join ARPANET through a TIP by summer 1973. 9f
.....ARPA/IPT(Dolan)

UCSD-CC : NETRJE will be available by 1 April 1973; initial contacts should be directed to Craig Mauldin as Network Consultant. 9g
.....Ken Bowles

UCSD-CC : A new Lisp interpreter is being implemented on the 8-6700 and should be completed within this calendar year. 9h
.....Ken Bowles

9i

OTHER NEWS

10

ARPANET : There are now: 35 Nodes; 15 TIPS; 16 PDP-10's, 10 TENEX Operating Systems; 6 PDP-11's; 2 PDP-1's; 5 IBM-360's; 1 IBM 370; 1 TX-2; 1 Honeywell 645; and 1 Sigma 7. In July, the first CDC 6000 Series computers will join the network.

10a

10b

ARPA/IPT : Transfer of functions to RML and MITRE Several functions previously performed directly by ARPA/IPT relative to the Network will in the future be performed by RML and the MITRE Corporation. RML's functions are described in the featured-site article and those of MITRE will be featured in the next issue of ARPANET NEWS. Editors

10c

SRI-ARC : New version of Resource Notebook currently being sent to new users; old users next; priority to old users who will validate information and submit updates.

..... Jake Feinler

10d

10e

TENEX : RJS problems

TENEX uses two different end of line indicators (EOI -- one byte -- and CR/LF -- two bytes) while their RJS program that submits jobs to CCN will sometimes not accept data from TENEX because TENEX's record count does not match CCN's. The easiest way to remedy the problem is to read the data file into TECO and then output (;U) it back to a TENEX file. Dave Crocker (UCLA-NMC)

10f